

SECTION 795

LANDSCAPE MATERIAL

795.1 GENERAL:

Material used for landscaping purposes shall be in conformance with this Section.

Submit certificates for approval for the following:

1. Ship materials with Certificate of Inspection required by governing authorities. Before delivery, Certificates of Compliance shall be submitted, certifying that materials meets the specified requirements. Certified copies of the reports for the following materials shall be submitted:
 - a. Transporting of Cacti and Protected Plants (from the Arizona Department of Agriculture).
 - b. Soil Amendments, Fertilizers, and Conditioners
2. For commercially-produced products, submit other data certifying that materials comply with specified requirements.
3. The Certification shall indicate; supplier's name, address, telephone number, date of purchase, name and technical description of the item purchased, and quantity of each item purchased.
4. Material samples shall be forwarded in a single package to the Engineer within two weeks after the Notice To Proceed. Soils Test results, if required, shall accompany the samples of the materials.
5. The Engineer reserves the right at any time to take and analyze samples of materials for conformity to this Section and the special provisions. Furnish samples upon request. Rejected materials shall be immediately removed from the project at no additional cost to the project. The cost for removing installed materials, that have been subsequently rejected shall be borne by the Contractor.

For identification and inspection, durable, legible labels, bearing the plant's name in water-resistant ink, shall be attached to all nursery stock or container of stock delivered to the project.

Protect landscape materials delivered to the work site from damage due to operations by other contractors, trades, and trespassers. Maintain protection during installation period.

Applicable publications listed below form a part of this Section to the extent referenced:

1. American Association of Nurserymen, Inc. (AAN): American Standard for Nursery Stock (ASNS), 1986 Edition.
2. American Joint Committee on Horticultural Nomenclature (AJCHN): Standardized Plant Names (SPN), Second Edition, 1942.
3. Arizona Nursery Association Growers Committee (ANA): Recommended Tree Specifications, latest edition

Manure may not be used on the project.

795.2 TOPSOIL:

Imported topsoil shall be a fertile, friable soil, obtained from well-drained arable land which has or is producing healthy crops and shall be reasonably free of subsoil, roots, twigs, branches, brush, grasses, litter, construction debris, refuse, roots, heavy clay, clods, noxious and invasive weed seeds, phytotoxic materials, coarse sand, rocks greater than three inches or other deleterious or toxic to plant growth. At least 10 days prior to delivery of topsoil to the site, the Contractor shall furnish the Engineer at no additional cost to the project, with a written soil analysis prepared by a certified laboratory approved by the Engineer for each proposed source of topsoil. A minimum of five analysis samples per each 500 cubic yards of imported material, per source, shall be tested and analyzed. The Engineer's written approval for each source shall be obtained prior to delivery of topsoil to the project area.

The top four to six inches of on-site soil may be salvaged and utilized for topsoil, provided that it meets the requirements herein. In-situ soil not meeting this specification may be amended as described below.

The analysis results obtained for each characteristic from each material source shall meet the following requirements. For a topsoil source to be acceptable, a minimum of 3/5 of the tests and analyses shall meet or exceed the specifications below.

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Table 795-1		
Characteristics	Test Method	Requirement Average of 5 Analyses
pH	Arizona 237	6.0 - 8.3
Soluble Salts (PPM)	Arizona 237	2,000 Maximum
Calcium Carbonate	Arizona 732	8% Maximum
Exchangeable Sodium	Arizona 729	5% Maximum
Exchangeable Sodium (PPM)	Arizona 729	300 Maximum
Plasticity Index (PI)	AASHTO T 90	5-20
Gradation: 2 inch ½ inch No. 40	Arizona 201	% Passing: 100 85-100 85-100

If the test results for a proposed source fails to meet the specifications listed above, the material from that source shall be deemed unacceptable and rejected for use on the project. At such time, the contractor may propose for the Engineer's consideration a method of treatment or incorporation of materials or amendments to meet the specifications. Provided the Engineer approves of the contractor's proposal or requires additional remedial actions to be undertaken prior to acceptance of the proposal for use on the project, an approximately five cubic yard sample of the unacceptable topsoil shall be treated in accordance with the approved proposal. The modified material shall then be tested and reanalyzed by the contractor at no additional cost to the project for compliance with the specifications. The five cubic yard sample preparation and testing may be conducted on-site or at the material source location. There will be no limit on the number of allowed topsoil modification attempts to meet the project requirements, except that modified topsoil not meeting the requirements will not be allowed in the finished construction. Topsoil, modified as required to meet the specifications, will be accepted for use on the project.

Prior to installation or placement, accepted topsoil shall be evaluated for its nutrient and fertility properties. As soon as possible after acceptable topsoil is excavated or generated via the modification process above, a one-gallon grab sample shall be collected for each 5,000 square feet of installed area (minimum of two samples) for use in agricultural fertility analyses by a certified laboratory as approved by the ENGINEER. The soil analysis shall include all properties necessary to make fertility recommendations for landscape, lawn, and garden applications. Perform and include a soil analysis documenting the parts per million (ppm) of Ca, Mg, Na, K, Fe, Zn, Mn, Cu, nitrate, nitrogen, and phosphorus at the test locations. The documentation shall also include levels of salinity, pH, sodium, and free lime. Also, the documentation must include recommendations from the laboratory for soil amendments to correct any nutrient deficiencies, eliminate conditions detrimental to plant growth, and improves soil fertility. Provide the analysis results and recommendations to the ENGINEER for review.

For each topsoil source location that has or is currently growing agricultural crops or where herbicides may have been used in the clearing of the vegetation, one bioassay test (0-1 foot depth) shall be required. Herbicides shall be treated with activated charcoal or similar materials as recommended by the certified laboratory to reduce or eliminate the deleterious effect of the remnant herbicides on plant growth and viability.

The Engineer reserves the right to accept minor deviations from these specifications if such acceptance is of benefit to the project.

Refer to Section 425 for installation and placement requirements related to topsoil used as a plating material and Section 430 if topsoil is used as a component of planting mixes.

795.3 SOIL FERTILIZING MATERIAL:

Fertilizing material shall comply with the applicable requirements of the State Agricultural Code. All fertilizing material shall be packaged, first grade, commercial quality products identified as to source, type of material, weight and manufacturer's guarantee analysis. It shall not contain toxic ingredients or fillers in quantities harmful to human life, animals or plants. It shall be delivered in unopened containers and shall have the chemical analysis as specified in the plans or specifications. Material, which has become caked or otherwise damaged, shall not be used.

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795.3.1 Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

795.3.2 Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

795.3.3 Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

795.3.4 Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial- grade FeDTPA for ornamental grasses and monocots.

795.4 ORGANIC SOIL CONDITIONERS:

In general, soil conditioners shall consist of a ground or processed wood product derived from redwood, ground or shredded fir, redwood or ponderosa bark. It shall have a nitrogen content of 1%, a pH not exceeding 7.5, and organic matter not less than 85%. Its gradation shall be such that at least 85% passes the 1/4 inch screen. In addition, it shall be treated with a non-toxic agent so as to be hygroscopic.

When manure is used as a soil conditioner, it shall be the product of yard fed cattle, free of weed seeds, straw or any other inert material and aged at least 3 months. This manure shall have been processed by grinding and screening and shall be of a consistency that will readily spread with a mechanical spreader.

795.4.1 Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:

1. Reaction: pH of 5.5 to 8.
2. Soluble-Salt Concentration: Less than 4 dS/m.
3. Moisture Content: 35 to 55 percent by weight.
4. Organic-Matter Content: 30 to 40 percent of dry weight.
5. Particle Size: Minimum of 98 percent passing through a 4-inch sieve.

795.4.2 Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture with 100 percent passing through a 1/2-inch sieve, a pH of 3.4 to 4.8, and a soluble-salt content measured by electrical conductivity of maximum 5 dS/m.

795.4.3 Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture with 100 percent passing through a 1/2-inch sieve, a pH of 6 to 7.5, a soluble-salt content measured by electrical conductivity of maximum 5 dS/m, having a water- absorbing capacity of 1100 to 2000 percent, and containing no sand.

795.4.4 Wood Derivatives: Shredded and composted, nitrogen-stabilized sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

795.4.5 Partially Decomposed Wood Derivatives: In lieu of shredded and composted wood derivatives, mix shredded and partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb/cu. ft. of loose sawdust or ground bark.

795.5 CHEMICAL SOIL CONDITIONER:

Chemical soil conditioners such as soil sulfur, gypsum or iron additive shall be commercially approved brands designated for agricultural use. Material which has become caked or otherwise damaged shall not be used.

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795.6 SEEDS:

Seeds shall be fresh, clean seeds, pre-mixed to the specified proportion. They shall be delivered to the site in original, unopened containers bearing the dealer's guaranteed analysis and germination percentage. They shall have a certificate or a stamp or a release accomplished by an agricultural commission.

795.7 PLANTS, TREES, AND SHRUBS:

795.7.1 General: All plants shall be representative of their normal species or varieties. Unless otherwise specified, plants shall have a growth habit typical of the species. They shall have normal, well-developed branch systems and vigorous, fibrous root systems that are not root bound and are free of kinked or girdling roots. Plants with undeveloped, loose, or broken rootballs will not be accepted. Plants shall be free from pests, scale, disfigured knots, sun scald injuries, bark abrasions, rough/craggy bark, or other objectionable disfigurements. Weak plants will not be accepted. Plants shall show the appearance of normal health and vigor in strict accordance with this Section and the special provisions.

Tree sizes shall generally conform to the ANA's recommended average tree specifications subject to variations due to seasonal considerations or material availability.

All stock shall have been grown in pots, cans, tubs, or boxes for a minimum of three months and a maximum of one year. They shall have sufficient roots to hold earth together after removal from the containers.

Stock shall be inspected and approved by the Engineer at the nursery or the Contractor's storage site prior to delivery to the project.

795.7.2 Cacti: Cacti shall be either nursery-grown or salvaged materials.

795.7.3 Trees: Trees shall be of the specified height, spread and caliper and shall stand erect without support. The height shall be measured from the root crown to the last division of the terminal leader with the branches in a normal position and the caliper shall be measured 12 inches above the crown roots. For palm trees only, the height shall be measured from the ground line to the base of the growing bud.

795.7.4 Shrubs: Shrubs shall be of the specified type, height and spread. They shall be selected from high quality, well-shaped nursery stock.

795.8 MISCELLANEOUS MATERIAL:

795.8.1 Headers and Stakes: Lumber for landscaping shall be construction heart, rough-sawn redwood in the sizes specified; splicing will not be permitted. Stake used with header boards shall be 2 x 4 inches, pointed and at least 18 inches long.

795.8.2 Tree Stakes: Unless otherwise specified, tree stakes shall be 2 x 2 inch redwood posts, free of knots and reasonably straight, and of sufficient length to properly support the tree.

795.8.3 Tie Wires: Tie wire shall be No. 12 AWG zinc coated wire and the cover for this wire shall be 1/2 inch garden hose.

795.8.4 Pre-Emergents: (per Claud)

795.8.5 Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: O, with a minimum of 95 percent passing through a No. 8 sieve and a minimum of 55 percent passing through a No. 60 sieve.
2. Form: Provide lime in form of ground dolomitic limestone.

795.8.6 Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.

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795.8.7 Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

795.8.8 Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 sieve.

795.8.9 Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/C 33M

- End of Section -

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